The North American TR7 & TR8

As fast as American automobile production lines produced their stock production cars, owners were just as quick to personalize their vehicles in any manner of ways. It was no different when British sports cars appeared on the roads of the United States and Canada. It was not unusual to see many owners personalize their cars using various methods of customization. A key component of this customization was to maximize the performance of stock cars. The Shelby Cobra, TVR Griffith and others created customizations with American V8 engines

When the TR7 came on the scene, many thought it was just a tease of the all new and futuristic corporate car. The TR8 was a big step but at the wrong time. New and powerful V8 engines were not enthusiastically received as gas lines around the country were a regular feature of the nightly news broadcasts. Undeterred, many pioneers were creating high performance TR7s and 8s, most created by factory backed racers of the day like Group 44, Inc., Huffaker Engineering, Ken Slagle, and Kas Kastner to name a few. Unfortunately that period was short lived and when the TR7s and 8s were phased out so were the performance parts. A resurgence occurred in the mid 80's when Land/Range Rover began producing a V8 engine with a bigger bore and an improved block. Edelbrock released the RPM Performer intake manifold and Holley had the 390 cfm carburetor made specifically for small displacement V8s. By the end of the 90's Rover took another step by creating larger bore and stroked V8s increasing its 3.5-liters engines to 4.6.

1978 Prototype TR7V8 Coupe

1980 TR8 Coupe

1980 TR8 Convertible

1981 TR8 Convertible

As these new engines and their high performance components reappeared on the market new innovators have stepped up to combine their love of the vintage Triumph with the opportunities to create high performance cars. One such innovator, Tim Lanocha, has created a team at Lanocha Racing, L.L.C. to bring new technologies to build some very fast cars.

Lanocha Racing has used each new variation of the Rover V8 and the latest technologies to create the ultimate wedges. Currently Lanocha Racing has the fastest Rover Block TR8 setting

a new track record for the ¼ mile at The Roadster Factory's Summer Party in 2005 with an ET of 11.86 seconds at 116.84 mph! This was done with a 5-liter fuel injected Rover V8 running through a T56 6 Speed transmission and a Dodge/Plymouth 8-3/4 rear axle.

Tim Lanocha's TR8 (fore ground) and Rick James's TR7 V8 (back ground) at Keystone Dragway in Pennsylvania

The culmination of these innovations is the Lanocha Racing's "Bulitt". It combines the vintage body kit with GM small block power. Bulitt uses fuel injection and an inter-cooled single turbo 355 cid engine with aluminum heads, T5 6 Speed Transmission, and Detroit Locker 9-inch ford rear axle. The engine is managed by a high tech computer system. The body is made from molds used in IMSA (International Motor Sports Association) racing circuits in the late 70's to the early 80's. The engine can deliver over 800 hp and can push the wind tunnel tested body in excess of 200 miles per hour

TR7 V8 (Bulitt) using a wide body performance competition body kit

Engines

The Rover V8 is a strong source of power. It originated back in 1961 by General Motors and stayed in production by Range/Land Rover until recently, when BMW took over plant production. Fortunately the parts for rebuilds are easily obtained. The levels of displacement are still growing. There are quite a few choices: 3.5, 3.9, 4.0, 4.2, 4.6, 5.0 and even a rumored 6.0 liter. Cams can be cut for specific car weight, gearing and power ranges. Heads are semi limited to original GM, Rover or some UK based aftermarket castings. Intakes can be fabricated but can be complex. Edelbrock and Offenhauser have great street intakes for 4 barrel carburetors. An entry level upgrade to the Rover V8 would include these typical combinations are the Holley 4 barrel, Edelbrock intake, .440 to .460 lift camshafts, and 4-2-1 headers with some minor head porting. This set-up is good for 200 to 215 horsepower and can be done on a weekend. The next step is using one of the larger displacement Rover engines with more carburetor, better distributor, bigger more sophisticated camshafts and valve train and either big bore 4-2-1 or 4-1 headers. The more exotic improvements can get results up to 300 horse power this involves removal of the engine out of the car. The bigger bore and stroked engines seem to break the 300 horse power barrier. The use of fuel injection, or forced induction is almost a necessity to break the 300 horsepower limit.

Stock 3.5 liter V8 in a TR8 coupe 133hp (left) Modified 3.5 liter V8 in a TR8 coupe 250hp (center) and a stroked 5.0 liter V8 in a TR8 convertible 360 hp (right)

Group 44 TR8 with a 3.9 liter Rover V8 using a cross ram intake manifold with, Lucas/Kinsler/Fuerstenau fuel injection with 360hp

4.6 liter Rover V8 300 plus hp

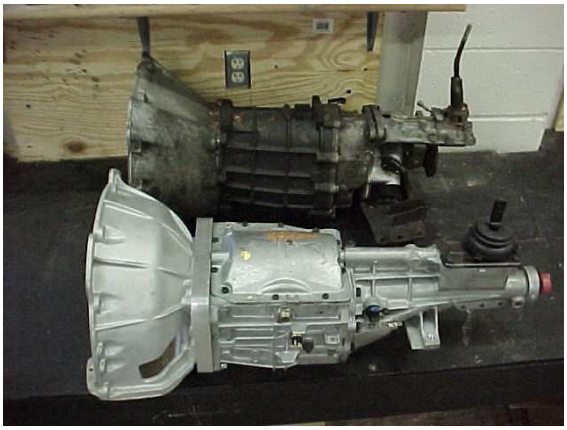
The 4 to 2 to 1 header (left) with a 1.5” diameter tubes and the 4 to 1 header (right) with a 1.75” diameter tubes designed by Lanocha Racing.

Engine upgrade conversion kit is comprised of a high lift and duration cam, lifters, timing cover gasket, valley pan gasket for the intake manifold, 4 barrel carburetor (390 to 600 cfm) with accessories, double roller timing chain and valve cover gaskets with the use of headers is good for at least 200 hp!

Transmissions & Clutches

With all this power comes the weak link. The Rover 5-speed transmission, a stock item to almost all manual transmission from 1977 to the early 90's can handle a certain amount of power. Depending on how aggressive the driver is, most Rover gear boxes can handle up to 220 hp, but rarely as much as 300hp. The factory race-prepared gear boxes with close ratio gear clusters are next to impossible to find and rebuilds do not last long when put through the gears. The Borg-Warner T-5 transmission using a Rover V8 pattern bell housing slips right in. It has a better lubrication system, a taller 5th over drive gear and came in thousands of GM and Ford cars. The throw out bearing is a hydraulic collar type and makes it possible for any clutch combination. The drive shaft will need to be modified for the T-5 and T-56 transmissions.

Stock TR8/Rover 3500 clutch assembly and flywheel (top) and the upgraded 10.5 inch diameter clutch disc, heavier pressure plate and a lightened flywheel a savings of 10lbs! (bottom)



T-5 (foreground) & Rover 5-Speed

If 5 forward gears are not enough the T-56 from late model Chevrolet Camaros and Corvettes is for you. The higher power larger displacement engines work well since it was developed for that application. Salvage yards are now carrying them as a normal part.

T-56 6-Speed


1961 to 1963 GM 215 bell housing for a T-10 with adaptor for a T-5 5 speed (left) and the adaptor for a T-56 6-speed on the (right)

Final Drive – Rear Axle

The rear axle of the TR7 and TR8 share the same housing, bearings and seals with the exception of the gearing which can be a 3.90, 3.45 or 3.08:1 ratio. The bearings and hub for the pinion are the wear points. But, when the engine is upgraded the rear end is the first to indicate a new found issue. It is not cost effective to take the stock rear axle and try to modify it to withstand the increased power. The solution is the Ford 8.8 and 9 inch rear axles. They come with large disc brakes, a wide variety of gear rations and posi-traction. At the same time tires and rims with a larger diameter can be used. The Dodge/Plymouth 8-3/4 rear axle with its removable center section for easy gear changing and it also provides the same features of the Ford.

A Lanocha Racing TR8 with a Dodge/Plymouth 8-3/4 rear axle equipped with a coil over spring set-up and disc brakes. The coil springs were moved inboard to gain space for wider tires.

Ford 8.8 inch rear axle modified for the stock TR7/8 suspension arms (left) Group 44 Franklin Baby Grand rear axle (right)

Brakes

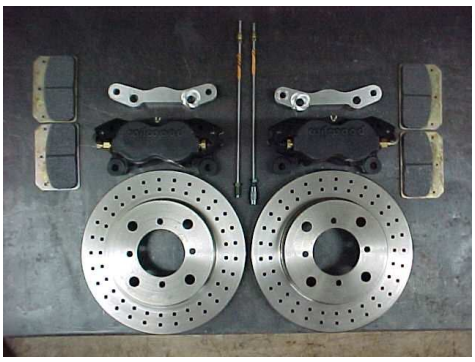
The real problems arise with all your new power. The first is braking and the stock TR7 and TR8 have a very under-sized caliper and rotor combination. Better brake rotors both in diameter (swept area) and thickness with venting should be installed. The 2 piston (pot) caliper is discarded and a 4 piston or even a 6 piston aluminum caliper can be put in its place with some adaptor brackets.

Stock TR8 front brakes

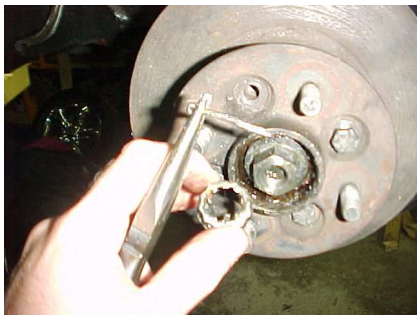
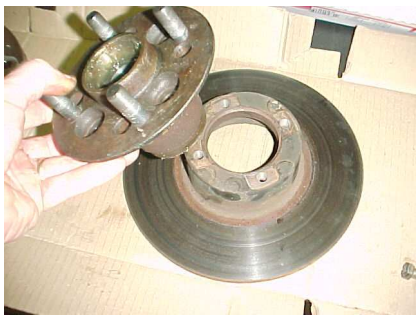
4 piston calipers with cross drilled and vented rotor

TR7 V8 with 6 piston calipers with a heavily modified front end and suspension

This 4 piston aluminum caliper and vented rotor conversion kit (available from Lanocha Racing) can be performed in a short amount of time.

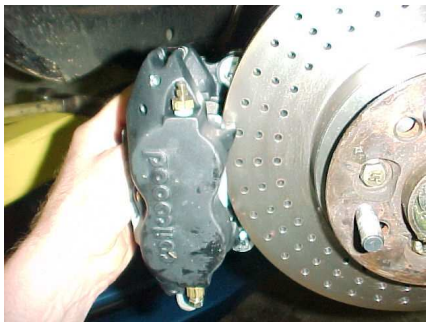


The kit comes with two new calipers, adaptors, brake lines, four pads and two cross drilled and vented rotors

Remove the stock caliper and bake lines (left). Remove the hub and rotor assembly (center) and remove the hub from the stock rotor (right).






Install the stock hub on to the upgraded rotor and be careful to inspect the bolts for thread damage and use a thread locker (top left) tighten the bolts as required by the Triumph service manual. Install new inner and outer wheel bearing and seal, hand tighten the spindle nut and install the cotter pin and pin washer (top center). Bolt the adaptor to the 4 piston caliper and then install on to the strut mounts (top right and bottom left). Install the new brake lines (bottom center). The finished product using the larger diameter rotor (bottom right)

The stock TR8 alloy or TR7 steel wheels will no longer fit without some serious machining or spacers. There are some aftermarket “vintage” 13-inch rims that will fit with the basic up grade kit. The larger rotor kit will work with larger rims over 15 –inches and provides better tire selection and traction.

16-inch diameter rim

13-inch diameter magnesium rim

With the front brakes being increased the rear brakes when installing the posi-traction Ford or Dodge/Plymouth axle ends make a great set up on all four corners. Lanocha Racing is working on a rear disc brake conversion for the TR7/8 rear axle to fit under the stock rims.

A work in progress for the stock TR7/8 rear end conversion to disc brakes (left and right)

The brake master for the TR7 and 8 seem to be adequate for the up graded brake rotors and calipers but with a larger displacement engine and higher speeds the larger brake rotors do not receive enough hydraulic force. A master cylinder has been matched up to the bolt pattern on the stock brake booster with a larger bore which is more than enough for the larger brake kits.

Upgraded brake master cylinder

There are more options for brakes … even a canister to help with very high lift and low vacuum engines for power assisted brakes using a booster.

Suspension

When horsepower is significantly increased the suspension will also require modification. The front suspension for the TR7/8 is based on the McPherson design common for the early 70's. The strut insert canister/tube can accommodate Koni, KYB Gas-a-just and Spax inserts with very little effort. These are a good choice for those who like to drive with some comfort on a long trip. The Spax and Koni are better suited for track and aggressive street driving but the Koni can not be adjusted unless removed from the car. The Spax strut can be adjusted (there are fourteen possible settings) with a special tool for the front and a screw driver for the rears. Replacing the stock springs with a shorter height and stiffer spring adds more to handling characteristics and gives the car an aggressive stance. The subframe, sway bar and lower arm bushings are available in stock rubber, upgraded rubber or urethane materials. A larger sway can be adjusted in the car installed as direct bolt in but isn't necessary. A strut brace gives the best results for tying in the strut towers. The brace will improve the front end body strength and handling. The only draw back to the brace is the fresh air duct can not be installed with out some serious modifications


Strut brace being installed in to a TR7 V8 conversion car which is a bolt in item.

The rear suspension is a live axle arrangement with two upper angled bars and two lower parallel arms. The spring is wedged between the lower arm and the frame rail. The shock is slightly outboard of the frame rail with some cut outs for mounting but with the configuration it does limit your rim and tire selection for width. The coil over kit eliminates the stock shock and spring and combines them into one package that can be welded in place.


Coil over conversion kit (left) and the installed coil over assembly (right)

The unibody construction has its inherent flaws. Through the years the modified TR8s and some stock TR8s have a similar problem with the rear suspension upper and lower arm mounting points and the floor area around the lower arm. When the engines power output is increased the body can not take the additional forces. The lower arm mounting holes will oblong and the control arm will often make noise. This can be easily fixed by adding a plate or just welding the washers to the body.

The upper and lower mounting points have been reinforcing with welded plates

When the damage to the body is too great from aggressive driving, (usually at the transmission tunnel or the floor board areas) cracks or tears will appear. Lanocha Racing has solved the problem with a frame rail connector to connect the back suspension arm mounting point to the front frame. This results in the forces applied to the arm to floor point being distributed through out the body and not concentrated in one location.

A typical torn floor pan that has reached the drain plug from the lower arm mounting point

Installation of a frame rail connector from the lower arm mounting point to the front frame member

Finished with additional boxing of the rear arm mounting area and front frame member

A roll cage is a rather high end solution but when installed properly using the right body mounting point can provide excellent body strength.

Competition TR8 Roll Cage (left) TR7 V8 street car (right)

The Body

With the “pop-up” head lights, wedge shape, and fashionable interiors Triumph advertised the TR7 and TR8 as “The shape of things to come” and “The shape of things that win”. For the competition race groups the car was a better Triumph. With racing came body modifications and, in most cases, lots of fiberglass. Group 44, Inc. best known for their efforts made a winner out of Triumph’s ugly duckling. They developed a body kit capable of 180 mph top speeds. The draw back was the wheel base and the rear window area of the coupes. A modified TR8 coupe can reach 135 mph but any faster the back end tends to get a little light due to the vacuum created by the rear glass. With a wider stance, a big rear spoiler and function front air dam the envelope was opened up. The body kit is now available from Lanocha Racing. It consists of the front air dam, front and rear fenders/wings, rear spoiler (10 inches tall!) and the optional hood/bonnet without louvers.


The fenders can be mounted by one of two ways.


The Front fenders have the original rain/water gutter channel as on the factor fenders for fastener applications. The channel can be removed and adhesives or fiber-glassed used in place of fasteners. You can completely remove the original fender (right) or leave it in place (left).



Stock rear fender (left) new fiberglass fender installed over the original (middle) and the with the 12 inch wide rim installed (right). The fenders can be fastened in place on the lower edge, bottom of the back light area. The top area needs adhesives or fiber-glassed on.


The front air dam was originally molded to be removable for transport. Clips and fasteners are needed for this panel


Body panels fitted and partially installed (left and right) including the rear spoiler (right) that bolts directly on.


Body panels finished and in paint!

In addition to the body panel kit above, Lanocha Racing has molds for a less aggressive body kit used by Huffaker Engineering.


Huffaker Engineer 4 part fender kit (left and right)

The famous Group 44 #44 TR8 resting in Sebring Florida, 2001 (left) Group 44 TR8 in action with Jay Fox as the fuel man in 1979 (right)

Lawton ”Lanky “ Foushee creator of the Group 44 TR8s with #4 TR8 (left) and Huffaker Engineering TR8s (right)